



# PROLONGING THE LIVES OF HIV PATIENTS WITH BREAKTHROUGHS AT THE ADVANCED PHOTON SOURCE

Scientists used X-ray crystallography techniques at the Advanced Photon Source to pinpoint how the atoms of Kaletra® interact with the HIV viral protein and where the drug should target the virus.

## THE OPPORTUNITY

Ultra-bright, high-energy X-ray beams like those produced at the U.S. Department of Energy's Advanced Photon Source (APS) at Argonne National Laboratory have opened the door to more targeted and effective drug development.

A technique known as macromolecular crystallography reveals the structure of proteins and virus particles, allowing researchers to pick a molecule that is perfectly suited to halting a disease's spread.

This technique has been at the forefront of the symbiotic relationship between sources of high-brightness X-rays and drug discovery.

## THE PIVOTAL DISCOVERY

One of the most successful drugs used to stop the progression of the HIV virus into AIDS got its start at the APS.

In 1996, scientists from Abbott Laboratories (Abbott Park, Ill.), who were using the APS, discovered a way to stop the HIV virus from replicating in the body. Out of that work came the drug Kaletra®. Kaletra® was approved by the FDA in 2000.

To develop the drug, researchers used the Industrial Macromolecular Crystallography Association Collaborative Access Team beamline, which is operated through a contract with the Hauptman-Woodward Medical Research Institute (Buffalo, N.Y.).

## THE IMPACT

- In 2002, Kaletra® became the most-prescribed drug in its class for HIV therapy, and it remains widely used today.
- Kaletra® has been successful in prolonging the lives of thousands of HIV patients.



The Advanced Photon Source at Argonne is one of the world's most powerful X-ray sources.

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